

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, DC 20554**

In the Matter of)	
)	
Public Safety and Homeland Security)	PS Docket No. 18-339
Bureau Request for Comment on)	
Hurricane Michael Preparation and)	
Response)	

To: Chief, Public Safety and Homeland
Security Bureau

**COMMENTS OF
SOUTHERN COMPANY SERVICES, INC.**

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EXECUTIVE SUMMARY

With a service area that encompasses a large swath of the hurricane-prone Southeastern United States, Southern Company Services, Inc., its electric utility operating company affiliates – Alabama Power Company, Georgia Power Company, Gulf Power Company and Mississippi Power Company – and its communications service provider affiliate Southern Linc (collectively, “Southern”), have extensive experience with, and well-developed processes and procedures for, preparation, response, and restoration with respect to major storm events. Southern has seen its share of powerful hurricanes – including Opal (1995), Ivan (2004), Katrina (2005), Dennis (2005), Matthew (2016), and Irma (2017) – and was able to draw on its extensive experience with storms of such magnitude in its preparation for and recovery from Hurricane Michael.

As described herein, these comments will provide the Commission with a better understanding of utility service restoration efforts following Hurricane Michael and specifically address various items in the Public Notice (Gulf Power Company will be submitting separate comments providing more specific details in response to the Public Notice, and Southern incorporates Gulf Power’s comments by reference). In addition, Southern’s comments will illustrate how Southern Linc’s implementation of utility-based standards and procedures for design, construction, and emergency preparedness and response is a key factor in the exceptional resiliency of its wireless communications network.

Electric restoration after a storm of the magnitude of Hurricane Michael is a complicated, labor-intensive process that involves nearly *every* employee, as well as marshalling and managing mutual assistance resources from across the country. Approximately 614,000 electric customers within the Southern Company service territory were impacted by Hurricane Michael, with damage to hundreds of miles of electric lines and thousands of distribution poles. Despite the nearly unprecedented level of damage, Southern was able to quickly restore electric service

throughout the affected areas. Overall, the level of damage and destruction caused by Hurricane Michael required extensive recovery efforts by multiple parties to clear roads and restore services, particularly during the first 48 hours.

Southern's experience with storms indicates that redundancy and hardening are two of the keys to improving resiliency, readiness and response. The Commission therefore might consider encouraging communications providers to implement the type of redundancy, hardening and response mechanisms with respect to their communications networks that electric utilities are expected to employ in the normal course of operations.

As described in detail in these comments, the performance of Southern Linc's communications network during and immediately after Hurricane Michael demonstrates the importance of resiliency, redundancy, and reliability in communications system design and construction, especially in areas prone to severe conditions such as hurricanes. Unlike the networks and systems of other commercial wireless providers, Southern Linc's system was designed and constructed from the outset to rigorous utility-grade standards in order to meet the demanding operational requirements of electric utility communications systems. In addition to physically hardened infrastructure, Southern Linc's system design and construction includes backup power at every site, generators with on-site fuel at almost every site, and redundant backhaul and transport links. These design and construction standards have been key to the survivability and swift recovery of the Southern Linc network following every major storm event to strike its service area – including Hurricane Katrina and Hurricane Michael – and have yet to be met by other commercial communications providers. Additionally, Southern Linc's emphasis on storm preparation and pre-positioning of assets and personnel prove critical in the rapid response of storm restoration efforts. Based on its performance during and after numerous large-

scale storm events over the years, Southern Linc's experience provides useful guidance on ways to improve the resiliency of the nation's wireless networks.

First, Southern Linc notes the importance of backup power provided by on-site generators and/or fuel cells. While having an on-site generator at every site may not be economically or logistically feasible, many wireless carriers do not have generators even at sites that the carrier has identified as critical to its network operations, even though the importance of on-site generators for network resiliency was identified over a decade ago during the Commission's review of Hurricane Katrina.

Second, Southern Linc notes the importance of redundancy in backhaul and transport links for communications systems. While some carriers attributed delays in the restoration of their own service to lost connectivity due to fiber cuts, Southern Linc overcame any fiber disruptions through its use of redundant design and planned alternatives. By designing and implementing redundancy and backup transport alternatives into their systems as Southern Linc has done, particularly where the transport link has been identified as critical, carriers can significantly improve the resiliency of their wireless networks. On a related note, Southern Linc observes that third party transport providers can often be an obstacle to prompt restoration of wireless services, and therefore supports the Commission's examination of the role of backhaul and transport providers in the Wireless Resiliency Cooperative Framework.

Finally, the experience of Hurricane Michael underscores the critical need to ensure interoperability between public safety communications systems, regardless of which network they may be on. Southern Linc therefore strongly urges the Commission to formally clarify that ensuring interoperability between public safety communications systems and other wireless networks is a fundamental responsibility of FirstNet.

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COMMENTS OF SOUTHERN COMPANY SERVICES, INC.

Southern Company Services, Inc., on behalf of its electric utility operating company and communications service provider affiliates (collectively, “Southern”), hereby responds to the Public Safety and Homeland Security Bureau’s (“Bureau”) request for comment on specific questions concerning stakeholders’ readiness, preparation, and response with respect to Hurricane Michael.¹ With a service area that encompasses a large swath of the hurricane-prone Southeastern United States, Southern has extensive experience with, and well-developed processes and procedures for, preparation, response, and restoration with respect to major storm events.²

¹ / “Public Safety and Homeland Security Bureau Seeks Comment on Hurricane Michael Preparation and Response,” Public Notice, DA 18-1176, PS Docket No. 18-339 (rel. Nov. 16, 2018) (“Public Notice”).

² / Gulf Power Company – one of Southern’s electric utility operating companies – will also be submitting separate comments responding to specific issues raised in the Public Notice.

I. INTRODUCTION

Southern Company Services, Inc. is a wholly owned subsidiary service company of Southern Company, a holding company based in Atlanta, Georgia, which operates regulated electric and natural gas utilities serving 9 million customers in nine states. Southern Company owns four electric utility subsidiaries – Alabama Power Company (“Alabama Power”), Georgia Power Company (“Georgia Power”), Gulf Power Company (“Gulf Power”), and Mississippi Power Company (“Mississippi Power”) – which provide retail and wholesale electric service throughout a 120,000 square mile service area in Georgia, the southern two-thirds of Alabama, southeastern Mississippi, and the Panhandle of Florida. Southern Company supplies wholesale electric power to municipalities, rural electric cooperatives, and other distribution providers through its Southern Power subsidiary, which operates natural gas, solar, wind, and biomass generating facilities in nine states. Southern Company Gas provides natural gas distribution and storage in nine states: Illinois, Georgia, Tennessee, Virginia, California, Texas, Louisiana, Alabama, and Florida.

Southern Communications Services, Inc. d/b/a Southern Linc (“Southern Linc”), a wholly owned subsidiary of Southern Company, operates a commercial digital 800 MHz ESMR system to provide interconnected voice, dispatch, push-to-talk, text and picture messaging, internet access, and data transmission services over the same handset. Southern Linc provides these services over a 127,000 square mile service territory covering Georgia, Alabama, southeastern Mississippi, and the Panhandle of Florida. Southern Linc offers comprehensive geographic coverage, serving the extensive rural territory within its footprint as well as major metropolitan areas and highway corridors. Because of its expansive regional coverage and history of reliability, Southern Linc’s service is widely used by state and local public safety agencies, school districts, rural local governments, public utilities, and other emergency

responders. It is also utilized by other commercial entities in both urban and rural areas.

Southern Linc is in the process of transitioning its network from the iDEN air interface to an all-LTE platform.

As a subsidiary of Southern Company, Southern Linc also supports the internal communications needs of its affiliated electric utility operating companies. These include not only mobile services but also fixed point-to-point and fixed point-to-multipoint wireless services for a variety of applications that support the safe, reliable, and efficient delivery of essential electric utility services, such as monitoring, load management, and supervisory control and data acquisition (“SCADA”) systems.

Southern Linc’s service area includes those areas of Florida, Georgia, and Alabama directly affected by Hurricane Michael. Southern Linc designed and constructed its communications network from the outset as a mission-critical network engineered to rigorous utility-grade standards. As discussed herein, the resiliency and reliability of Southern Linc’s communications network was demonstrated by the speed with which Southern Linc was able to restore service in the wake of Hurricane Michael. Based on its performance during and after numerous large-scale storm events over the years, including Hurricane Michael, Southern Linc’s experience provides useful guidance on ways to improve the resiliency of the nation’s wireless networks.

Gulf Power, headquartered in Pensacola, Florida, serves approximately 462,000 customers in northwest Florida, including customers in Panama City, Florida and other areas of Bay County, Florida that were hardest-hit by Hurricane Michael.³

³ / As noted above, Gulf Power is also submitting a separate filing responding to specific issues raised in the Public Notice.

Georgia Power, headquartered in Atlanta, Georgia, serves over 2.5 million customers throughout the state of Georgia, including customers in Southwest Georgia – Albany, Americus, Macon, Valdosta, and Vidalia – hardest-hit by Hurricane Michael.

Alabama Power, headquartered in Birmingham, Alabama, serves approximately 1.4 million customers throughout the southern two-thirds of Alabama, including customers in the areas of Southeast Alabama hardest-hit by Hurricane Michael.

As described herein, these comments will provide the Commission with a better understanding of utility service restoration efforts following Hurricane Michael and specifically address various items in the Public Notice. In addition, these comments will illustrate how Southern Linc’s implementation of utility-based standards and procedures for design, construction, and emergency preparedness and response is a key factor in the exceptional resiliency of its wireless communications network.

II. RESTORATION OF SERVICES FOLLOWING HURRICANE MICHAEL

Hurricane Michael made landfall on October 10, 2018, as one of the strongest hurricanes to ever strike the mainland United States, devastating the Florida Panhandle and maintaining hurricane strength well into central Georgia hundreds of miles inland, resulting in an unprecedented level of damage and destruction. As the Commission correctly notes in the Public Notice, Hurricane Michael was the strongest storm to hit the Florida Panhandle in recorded history, and the strongest storm to hit the continental United States since Hurricane Andrew in 1992.⁴ Hurricane Michael was still a Category 3 hurricane as the storm’s eye crossed into Georgia – the strongest storm to enter that state since 1898⁵ – with hurricane-force winds

⁴ / See Public Notice at 1.

⁵ / See “List of Continental United States Hurricane Impacts/Landfalls, 1851-2017,” Hurricane Research Division, Atlantic Oceanographic and Meteorological Laboratory, National

extending well into southeastern Alabama and tropical storm-force wind gusts observed as far north as Atlanta.⁶

Southern has seen its share of powerful hurricanes in just over the past two decades, – including Opal (1995), Ivan (2004), Katrina (2005), Dennis (2005), Matthew (2016), and Irma (2017) – and was able to draw on its extensive experience with storms of such magnitude in its preparation for and recovery from Hurricane Michael.

A. Electric Utility Restoration Following Hurricane Michael

Electric restoration after a storm of the magnitude of Hurricane Michael is a grueling, complicated, labor-intensive, all-hands-on-deck affair. It not only involves nearly *every* employee, but also involves marshalling and managing mutual assistance resources from across the country. For example, Mississippi Power prepositioned mutual assistance crews in Florida before Hurricane Michael made landfall in order to rapidly assist with restoration efforts.

Approximately 625,000 customers within the Southern Company service territory were impacted by Hurricane Michael – including approximately 140,000 of Gulf Power’s electric service customers, approximately 396,000 customers in Georgia Power’s service area, and more than 89,000 Alabama Power customers. Georgia Power estimates that damage to its electric distribution system from Hurricane Michael includes more than 4,800 spans of wire down and approximately 2,000 broken or damaged power poles. Georgia Power’s transmission system was also significantly damaged, with over 2,000 miles of transmission lines impacted, over 200 structures damaged, and over one hundred transmission spans down. Overall, it was the most

Oceanic and Atmospheric Administration,
http://www.aoml.noaa.gov/hrd/hurdat/All_U.S._Hurricanes.html (last visited Dec. 17, 2018).

⁶ / See, e.g., *Michael Leaves Atlanta with Downed Trees, Power Outages, Road Closures*, ATLANTA JOURNAL-CONSTITUTION (Oct. 11, 2018), <https://www.ajc.com/weather/metro-atlanta-wakes-storm-damage-rain-clear-michael-weakens/hocbYQ8Apt2eatZIqLUPZJ/>

significant single storm to impact Georgia Power's transmission system in at least 25 years. Nevertheless, within 24 hours after the storm had passed, Georgia Power had restored electricity to 50% of its affected customers. Within 60 hours, Georgia Power had restored electricity to 75% of its affected customers, a number that rose to 95% within four days after the storm. Within one week after the storm, Georgia Power had restored electricity to 99% of its affected customers.

In Alabama, Alabama Power restored electricity to more than 89,000 customers affected by the storm, including more than 42,000 customers who experienced sustained outages from Hurricane Michael. Alabama Power replaced nearly 100 poles and 275 spans of wire in Alabama and then joined mutual assistance efforts by helping to restore electric service to customers of its neighbor utilities in Georgia and Florida.

In Florida, Gulf Power's restoration effort required replacement of approximately 7,000 distribution poles and 200 miles of distribution lines. Within 24 hours after the storm, Gulf Power had restored electricity to 25,000 customers. Within seven days after the storm, Gulf Power had restored electricity to approximately 80,000 customers, and within two weeks after the storm Gulf Power had restored electricity to all customers who could safely receive electric service at their premises.

Overall, the level of damage and destruction caused by Hurricane Michael required extensive recovery efforts by multiple parties to clear roads and restore services, particularly during the first 48 hours. In the Public Notice, the Bureau expresses concern over fiber cuts in Item #10:

News outlets and DIRS reported situations of fiber cuts during restoration. Even ten days after the storm hit, companies reported in DIRS that major fiber facilities were still out of service in Florida. Many communications providers reported having restored fiber links disabled by repair efforts

from other entities, include power utilities. How often and when did these cuts occur? What caused these fiber cuts? What steps, if any, did service providers take to minimize such cuts?⁷

Southern does not have knowledge of the specific information reported to the Commission by communications providers through DIRS or otherwise; however, Gulf Power did receive complaints directly from Uniti Fiber and its carrier customer, Verizon Wireless. To Gulf Power's knowledge, Uniti Fiber and/or Verizon Wireless initially blamed approximately 30 fiber cuts on Gulf Power. However, as Gulf Power explains in more detail in its separate filing in this docket, Gulf Power's own investigation revealed that four or fewer of these alleged fiber cuts were actually caused by Gulf Power or its contractors or mutual assistance crews, and that the vast majority of reported fiber cuts were likely caused by road-clearing crews within the first 48 hours after the storm.⁸

B. Coordination with Communications Providers

Southern's primary focus after an event like Hurricane Michael is the safe and quick restoration of power. For some electric customers, like nursing homes and hospitals, electric service restoration can be a matter of life and death. Even while undertaking challenging storm restoration efforts, Southern still coordinated and communicated regularly with communications providers regarding restoration status and efforts.

As described in its separate comments, Gulf Power went to extreme lengths and effort and undertook a number of extraordinary steps in its coordination with certain communications companies due to the highly unusual and almost unprecedented severity of Hurricane Michael. It is important to note that much of this communication and coordination is designed to occur at the

⁷ / Public Notice at 4.

⁸ / *See, e.g.*, Comments of Comcast Corporation, PS Docket No. 18-339, at 12 (filed Dec. 17, 2018).

state and local Emergency Management Agency (“EMA”) Emergency Operations Centers (“EOC”) and is available to any communications provider with a representative at the EOC.

The EOC mechanism is designed to provide government and public safety officials and providers of public services – including electric utilities and communications providers – with the information and coordination needed for recovery and restoration. At the EOC, a representative of a communications provider would be able to receive updates on a daily basis on the status and location of utility repair or reconstruction work, thus enabling the communications provider to perform its own repair and restoration work without conflict. In addition, a communications provider’s representative at an EOC would be able to coordinate directly with government, public safety, and utility representatives regarding the need to elevate the priority for restoration of particular routes or facilities that may be critical to that communications provider.

In short, there already exists a well-developed, multiagency, multi-stakeholder process for communication and coordination during emergency events, and communications providers have a responsibility to use this process to improve the resiliency of their wireless and other communications networks.

C. Recommendations for Commission Action

The Public Notice seeks comment generally on what actions the Commission can take to facilitate communications network resiliency, storm readiness and disaster response. Southern’s experience with storms indicates that redundancy and hardening are two of the keys to improving resiliency, readiness and response. The Commission therefore might consider encouraging communications providers to implement the type of redundancy, hardening and response mechanisms with respect to their communications networks that electric utilities are expected to employ in the normal course of operations. As described in more detail below in these

comments, Southern Linc's communications network was designed and constructed to utility-grade standards, which has been key to the survivability and swift recovery of the Southern Linc network following every major storm event to strike its service area, including Hurricane Michael.

Southern also agrees with the recommendations made by Gulf Power in its separately-filed comments that the Commission should consider whether and how its pole attachment policy is (1) facilitating or harming partnerships between electric utilities and communications attachers, (2) impairing or improving electric infrastructure resiliency (which is inextricably linked to communications infrastructure resiliency), and (3) incentivizing or disincentivizing strategic underground deployment of critical fiber backbone. Gulf Power addresses these issues in more detail in its separate comments, which Southern hereby incorporates by reference.

III. HURRICANE MICHAEL DEMONSTRATED THE RESILIENCY AND RELIABILITY OF THE SOUTHERN LINC COMMUNICATIONS NETWORK

The performance of Southern Linc's communications network during and immediately after Hurricane Michael demonstrates the importance of resiliency, redundancy, and reliability in communications system design and construction, especially in areas prone to severe conditions such as hurricanes. Unlike the networks and systems of other commercial wireless providers, Southern Linc's system was designed and constructed from the outset to rigorous utility-grade standards in order to meet the demanding operational requirements of electric utility communications systems. In addition to physically hardened infrastructure, Southern Linc's system design and construction includes backup power at every site, generators with on-site fuel at almost every site, and redundant backhaul and transport links. These design and construction standards have been key to the survivability and swift recovery of the Southern Linc network

following every major storm event to strike its service area – including Hurricane Katrina and Hurricane Michael – and have yet to be met by other commercial communications providers.

A. Preparation For and Response to Hurricane Michael

In order to ensure its ongoing preparedness for storms and other emergencies, Southern Linc participates in annual storm drills or other exercises that state and local government agencies perform throughout the year. In most cases, Southern Linc personnel play an active role in the drills and exercises as well as the follow up discussions. Southern Linc also deploys mobile assets in these exercises to practice coordination with its public safety customers and their restoration efforts. Internally, Southern Linc has annual table top exercises to simulate restoration of its network during and after incidents.

Southern Linc's Incident Support Team ("IST"), comprised of subject matter experts from all departments of the company, convenes as severe weather approaches or other disasters occur. To the extent possible, Southern Linc ensures lines of communication with state and local governments are open and working prior to known storms. Once an imminent event has been identified, Southern Linc coordinates staging of assets with state EMAs and utilities. At the same time, Southern Linc's IST and engineering teams implement storm preparation procedures, including completing any necessary tower work, topping off fuel for backup power generators, and ensuring availability of backup batteries. Southern Linc also coordinates in advance with third-party contractors, such as tower crews, should they be needed for restoration efforts.

After a severe weather incident occurs, Southern Linc responds quickly, and safely, to repair any damaged equipment in its territory, dispatching its own field crews from advance staging areas. Additionally, Southern Linc has a fleet of mobile assets which can be deployed to augment service in any impacted area so that capacity and coverage is available for those responding to the incident.

In the case of Hurricane Michael, Southern Linc began storm preparations once the storm's likely path and severity became known. These preparations included refueling backup generators, increasing staffing, and pre-positioning equipment, supplies, personnel and resources as close as possible to (but a sufficiently safe distance from) the storm's projected path to be able to respond rapidly to the projected impact areas in the Florida Panhandle, southern Georgia and southern Alabama. Southern Linc coordinated with partners to secure the pre-positioning of over 25 mobile assets in seven different counties within Georgia; seven counties in Alabama; and three different counties in Florida, including in Bay County which was hardest-hit by Hurricane Michael. Additionally, a Southern Linc representative was on site at the Georgia EMA from the activation of its State Operations Center ("SOC") through the duration of the storm, and Southern Linc had a designated liaison for direct communication and coordination with the EOCs for affected counties in Florida. This preparation and staging of assets and personnel allowed Southern Linc to respond quickly and begin restoration efforts as soon as the storm passed and it was safe to enter the affected areas.

Hurricane Michael made landfall near Panama City, Florida, at approximately 12:15 pm CDT on Wednesday, October 10. Southern Linc dispatched crews to the area later that day as soon as the storm had passed, but darkness and debris prevented access to the affected sites. At dawn the next day, October 11, Southern Linc crews were dispatched to begin restoration, including multiple tower crews sent to the Panama City area to simultaneously attempt to access the area via different routes. Throughout that day and the next, Southern Linc and Southern Company crews worked to bring many sites in the affected areas in Florida, Georgia, and Alabama back online without the assistance of third party backhaul or transport providers, which were not dispatching crews at that time. By 7:00 pm CDT on October 11, the day after the

storm, 60% of Southern Linc's sites that had been taken down by the storm had been restored to service, including all of its affected sites in southeastern Alabama. By the end of the day on October 12, all of Southern Linc's priority sites in Florida, including those in Bay County, had been restored or replaced with coverage through a variety of methods, including the deployment of over 20 mobile assets (*e.g.*, generators, Cells on Wheels ("COWs"), and satellite backhaul), repairing and replacing equipment, adding new microwave paths, adding new iDEN sites on towers that previously housed only LTE sites, and other measures.

As restoration efforts in Alabama and Georgia concluded, Southern Linc continued to move crews and deployable assets to the hardest hit areas of the Florida Panhandle to enhance its restoration efforts in that area. Throughout the storm response, Southern Linc worked closely with law enforcement and with utilities and other critical infrastructure providers to prioritize its efforts based on their most crucial needs. By October 16, less than a week after Hurricane Michael's initial landfall, Southern Linc's post-storm coverage and capacity not only equaled, but *surpassed* pre-storm levels.

B. Southern Linc's Speed of Restoration of Service

The resiliency and reliability of Southern Linc's communications network was demonstrated by the speed with which Southern Linc was able to restore service in the wake of Hurricane Michael. In particular, although Southern Linc – like all other wireless carriers – experienced cell site outages in the areas affected by Hurricane Michael, based on data reported to the Commission through DIRS Southern Linc successfully restored these sites at a much faster rate than the rest of the industry as a whole, due in part to Southern Linc's pre-preparation and staging of Southern Linc assets and personnel.

For example, on October 11 – the day after Hurricane Michael passed through – approximately 88 % of Southern Linc's sites in the affected areas were in service, compared to

approximately 81 % of the sites for all carriers combined.⁹ Just two days later on October 13, over 97 % of Southern Linc’s sites in Alabama and Georgia were in service and over 90 % of its sites in the affected areas in Florida were in service. By the following day – three days after the storm had passed through – the percentage of Southern Linc sites in service had increased to 100 % in Alabama, just over 99 % in Georgia, and almost 92 % in Florida. Significantly, this rapid pace of site restoration does not account for the even quicker restoration of service and coverage by Southern Linc to the affected areas through the use of COWs, microwave paths, and other measures.

One reason for Southern Linc’s ability to maintain and restore operational cell sites at a rate exceeding the rest of the industry is Southern Linc’s greater use of generators and fuel cells at its cell sites, including but not limited to those sites that have been identified as critical to its network operations. In order to ensure the resiliency and reliability of its wireless network, 99 % of Southern Linc’s LTE sites are equipped with a generator or fuel cell and 92 % of its iDEN sites are equipped with a generator. To the best of its knowledge, Southern Linc’s deployment of generators and fuel cells greatly exceeds the industry norm, even though the importance of backup power in general and on-site generators in particular for network resiliency was identified by the Commission over a decade ago following Hurricane Katrina.¹⁰

Another key factor in the resiliency of the Southern Linc network is Southern Linc’s use of redundant backhaul and transport links for its sites. Southern Linc uses fiber transport –

⁹ / See Communications Status Report, FCC, *Communications Status Report for Areas Impacted by Hurricane Michael, October 11, 2018* at 3 (rel. Oct. 12, 2018), <https://docs.fcc.gov/public/attachments/DOC-354510A1.pdf> (last visited Dec. 17, 2018).

¹⁰ / See Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks, “Report and Recommendations to the Federal Communications Commission”, June 12, 2006 (“Katrina Panel Report”), <https://transition.fcc.gov/pshs/docs/advisory/hkip/karrp.pdf> (last visited Dec. 17, 2018).

including transport provided by third party providers – as one of the means of connectivity for its sites, and Southern Linc experienced the same difficulties as other wireless carriers with damage and disruptions to its fiber transport. However, the comprehensive use of redundant microwave paths and other alternative transport links enabled Southern Linc to maintain and restore connectivity with its sites without the need to wait for the restoration of these fiber links.

C. Recommendations for Improving Wireless Resiliency

Based on its performance during and after numerous large-scale storm events over the years, from Hurricanes Ivan and Katrina all the way through Hurricane Michael, Southern Linc's experience provides useful guidance on ways to improve the resiliency of the nation's wireless networks.

1. On-Site Generators

Hurricanes and other storm events often cause widespread power outages. Although electric utility crews expend enormous effort to restore electric service everywhere as quickly as possible, wireless carriers should expect that a site located in a storm-damaged area could potentially be without commercial electric service for anywhere from 24 to 72 hours or even longer, which is well beyond the capacity of any battery-based backup power solution. While having an on-site generator at every site may not be economically or logistically feasible, many wireless carriers do not have generators even at sites that the carrier has identified as critical to its network operations. As noted above, the importance of on-site generators for network resiliency was identified over a decade ago during the Commission's review of Hurricane Katrina, yet little progress industrywide has been made since.

2. Redundancy in Backhaul and Transport

While some carriers attributed delays in the restoration of their own service to lost connectivity due to fiber cuts, Southern Linc also experienced disruptions in transport due to

severed fibers but quickly overcame them through its use of redundant design and planned alternatives such as microwave links. During and immediately after a large-scale storm event or other disaster, damage to communications fiber, electric distribution lines, and other infrastructure is inevitable and utterly predictable, and thus can and should be planned for in advance. By designing and implementing redundancy and backup transport alternatives into their systems as Southern Linc has done, particularly where the transport link has been identified as critical, carriers can significantly improve the resiliency of their wireless networks.¹¹

On a related note, Southern Linc observes that third party transport providers can often be an obstacle to prompt restoration of wireless services. While alternatives such as microwave links may enable quick restoration of connectivity, they may be a temporary or less than optimal solution for full service restoration, particularly along high-capacity paths, and it is therefore essential that primary transport links be restored to service as soon as possible. In many cases, however, wireless carriers must rely on third party providers for these transport services, as well as for the restoration of these services. It has been Southern Linc's experience, including during Hurricane Michael, that difficulties with site restoration can and do arise due to delays by third party transport providers in repairing and restoring their own transport services.¹² Southern Linc is therefore pleased that the Commission has opened an inquiry into the role of backhaul and

¹¹ / The 2006 Katrina Panel Report also identified "single points of failure in vital communications links" as one of the "failures in network resiliency and reliability" associated with that storm. *See, e.g.*, Katrina Panel Report at 5 – 6.

¹² / In at least one instance following Hurricane Michael, a third party transport provider refused to dispatch crews even though the sites were operational and the roads were passable by Southern Linc and electric utility vehicles.

transport providers in the Wireless Resiliency Cooperative Framework and supports the Commission's examination of this issue.¹³

3. Interoperability Between FirstNet and Other Public Safety Systems

Finally, the experience of Hurricane Michael underscores the critical need to ensure interoperability between public safety communications systems, regardless of which network they may be on. Large-scale events such as Hurricane Michael require an immediate response by and coordination among multiple public safety agencies and emergency first responders from multiple jurisdictions. The ability of these agencies to communicate and exchange information between applications, databases, and systems when responding to emergencies will save lives and property and protect first responders and the community. Southern Linc therefore strongly urges the Commission to formally affirm that ensuring interoperability between public safety communications systems and other wireless networks is a fundamental responsibility of FirstNet.¹⁴ Clarifying that AT&T and FirstNet must ensure interoperability with commercial carriers is supported at all levels – including sharing priority and preemption protocols, applications, local control, non-mission critical and mission-critical PTT communications, and off-air device-to-device communications – is not only life-saving public policy, but also required under the Spectrum Act.¹⁵

¹³ / “Public Safety and Homeland Security Bureau Seeks Comment on Improving Wireless Network Resiliency to Promote Coordination Through Backhaul Providers,” Public Notice, DA 18-1238, PS Docket No. 11-60 (rel. Dec. 10, 2018).

¹⁴/ See 47 U.S.C. §§ 1422, 1426; See also Letter from Michael D. Rosenthal, Southern Linc, to Marlene H. Dortch, Secretary, Federal Communications Commission, PS Docket Nos. 16-269, 12-94, 06-229, WT Docket No. 06-150 (filed Aug. 7, 2018); Boulder Regional Emergency Telephone Service Authority (“BRETSA”), Petition for Reconsideration, or in the Alternative, Petition Declaratory Ruling and Petition for Rulemaking, PS Docket Nos. 16-269, 12-94, 06-229, WT Docket No. 06-150 (filed Nov. 21, 2018).

¹⁵ / See Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, 126 Stat. 156 (2012) (“Spectrum Act”) §§ 6001, 6203; See also “Recommended Minimum Technical

IV. CONCLUSION

As described above, Southern's extensive experience with powerful storms such as Hurricane Michael demonstrate that hardening, redundancy, and preparedness are keys to improving resiliency and reliability, as shown by the restoration efforts of Southern's electric utility operating companies and by the performance of Southern Linc's communications network during and immediately after Hurricane Michael. Accordingly, the experience of Southern's electric utilities and of Southern Linc provides useful guidance on ways to improve the resiliency of the nation's wireless networks.

Respectfully submitted,

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Its Attorney

Dated: December 17, 2018

Requirements to Ensure Nationwide Interoperability for the Nationwide Public Safety Broadband Network" prepared by the Technical Advisory Board for First Responder Interoperability (available at <https://docs.fcc.gov/public/attachments/FCC-12-68A3.pdf>). First, section 6001 of the Spectrum Act defines "nationwide public safety broadband network" to mean an "*interoperable* public safety broadband network". Second, section 6203 established an interoperability board ("Board") to "develop recommended minimum technical requirements to ensure a nationwide level of interoperability for the nationwide public safety broadband network" based on "the commercial standards for Long Term Evolution (LTE) service." Third, the Board adopted interoperability criteria that established cross-platform interoperability based on an LTE standard. Permitting the persistence of vague or ill-defined standards that limit FirstNet's interoperability with other LTE systems vitiates not only the work of the Interoperability Board in preparing the technical recommendations governing interoperability, but also the will of Congress in adopting the Act.